

## **Highlighting the novel effects of high-intensity interval training on some histopathological and molecular indices in the heart of type 2 diabetic rats**

### **ABSTRACT**

**Background:** Type 2 diabetes is one of the most common metabolic diseases in recent years and has become an important risk factor for cardiovascular disorders. The first goal is to reduce type 2 diabetes, and in the case of cardiovascular disease, the second goal is to reduce and manage that disorder.

**Materials and methods:** The rats were divided into 4 groups: Healthy Control (n=8), Diabetes Control (n=8), Diabetes Training (n=8), and Healthy Training (n=8). The protocol consisted of 8 weeks of High-intensity interval (5 sessions per week), where the training started with 80% of the peak speed in the first week, and 10% was added to this speed every week. To measure the level of B-catenin, c-MYC, GSK3B, and Bcl-2 proteins using the western blot method, cardiac pathological changes were measured using hematoxylin and eosin staining, Masson's trichrome and PAS staining and apoptosis using the TUNEL method.

**Findings:** Histological results showed that diabetes causes significant pathological hypertrophy, fibrosis, and severe apoptosis in heart tissue. HIIT training significantly reduced pathological hypertrophy and fibrosis in heart tissue, and the rate of cardiomyocyte apoptosis was greatly reduced. This research showed that diabetes disorder increases the levels of B-catenin and c-Myc proteins and causes a decrease in the expression of GSK3B and Bcl-2 proteins. After eight weeks of HIIT training, the levels of B-catenin and c-Myc proteins decreased significantly, and the levels of GSK3B and Bcl-2 proteins increased.

**Conclusion:** This study showed that HIIT could be a suitable strategy to reduce cardiomyopathy in type 2 diabetic rats. However, it is suggested that in future studies, researchers should perform different intensities and exercises to promote exercise goals in type 2 diabetic cardiomyopathy.